

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:

Feuerstraeter et al.

Application No.: 09/990,916

Filed: November 16, 2001

For: An Interface and Related Methods for
Dynamic Channelization in an Ethernet
Architecture

Examiner: Yves Dalencourt

Art Group: 2157

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SECOND AFTER FINAL AMENDMENTS AND RESPONSES

Sir:

In response to the Advisory Action mailed March 23, 2007, please enter these amendments and consider the following responses.

Amendments to the Claims are reflected in the listing of claims that begins on page 2 of this paper.

Remarks begin on page 8 of this paper.

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

Claims 1-29 Cancelled

30. (Currently Amended) A method comprising:

identifying a communication capability of a remote device;

automatically aggregating multiple media access controllers (MACs), based, at least in part, on the identified communication capability of the remote device, to establish a virtual data sub-channel within a physical data channel for communication between a communication interface and the remote device, the aggregating via an attachment unit interface (AUI) having four (4) 10Gb/s attachment unit interface (XAUI) channels, each channel supporting 2.5Gb/s communication rates which are aggregated to provide a 10Gb/s physical channel;

determining whether a data rate of the virtual sub-channel is compatible with the communication capability of the remote device; and

reducing the data rate of the virtual sub-channel if the data rate is not compatible with the communication capability of the remote device.

31. (Previously Presented) A method according to claim 30, wherein the communication link is an IEEE 802.3ac compliant communication link, with a data channel of 10 gigabit per second (Gb/s).

32. (Previously Presented) A method according to claim 30, wherein identifying a communication capability of the remote device comprises:

 sending a capability request; and

 receiving a response to the request denoting at least the communication capability of the remote device.

33. (Previously Presented) A method according to claim 30, wherein identifying a communication capability of the remote device comprises:

 receiving an indication from the remote device denoting the communication capability of the remote device.

34. (Previously Presented) A method according to claim 33, wherein the indication also denotes a processing capability of the remote device.

35. (Previously Presented) A method according to claim 30, wherein the communication capability of the remote device is obtained by the communication interface through a negotiation process.

36. (Previously Presented) A method according to claim 30, wherein establishing the virtual data sub-channel within a physical Ethernet data channel comprises establishing a sub-10 gigabit per second (Gb/s) virtual data channel within a physical 10Gb/s data channel.

37. (Previously Presented) A method according to claim 30, wherein reducing the data rate of the virtual sub-channel comprises inserting idle control elements between substantive frames of a data stream of the virtual sub-channel.

38. (Previously Presented) A method according to claim 36, wherein establishing the virtual sub-channel comprises:

automatically aggregating 1Gb/s media access controllers (MACs) to establish the virtual sub-channel; and

dynamically multiplexing the 1Gb/s MACs to appropriate channels of an attachment unit interface (AUI).

39. (Currently Amended) A storage medium comprising content which, when executed by an accessing computing appliance, causes the appliance to implement a scalable network interface to:

automatically aggregate multiple media access controllers (MACs) to establish a virtual channel within a physical Ethernet channel based, at least in part, on an identified communication capability of a remote network element, the aggregating via an attachment unit interface (AUI) having four (4) 10Gb/s attachment unit interface (XAUI) channels, each channel supporting 2.5Gb/s communication rates which are aggregated to provide the physical Ethernet channel;

determine whether a data rate of the virtual channel is compatible with the communication capability of the remote device; and

further reduce the data rate of the virtual channel if the data rate is not compatible with the communication capability of the remote device.

40. (Previously Presented) A storage medium according to claim 39, wherein the physical Ethernet channel is a 10 gigabit per second (Gb/s) data channel, while the virtual channel is a sub-10Gb/s data channel, wherein the size of the virtual channel is selected to correspond with the identified communication capability of the remote network element.

41. (Previously Presented) A storage medium according to claim 39, the scalable network interface comprising negotiation feature(s) to identify one or more of a communication capability of a remote device and a processing capability of a remote device.

42. (Previously Presented) A storage medium according to claim 39, wherein the scalable network interface establishes a virtual channel by dynamically aggregating one or more 1Gb/s media access controller(s) (MAC) and routing content from the aggregated MAC(s) through one or more ~~attachment unit interface (AUI)~~ XAUI channel(s), as appropriate.

43. (Currently Amended) An apparatus comprising:

control logic, to identify a communication capability of a remote device
communicatively coupled with the control logic through a communication link; [[and]]

a plurality of media access controllers (MACs), responsive to the control logic, automatically aggregated by the control logic to establish either a 10 gigabit per second (Gb/s) physical channel or a sub-10Gb/s virtual channel within the 10Gb/s physical channel to facilitate communication from the apparatus to the remote device based, at

least in part, on the identified communication capability of the remote device, wherein the control logic further to determine whether a data rate of the established channel is compatible with the communication capability of the remote device and cause the aggregation of MACs to reduce the data rate of the established channel if the data rate is not compatible with the communication capability of the remote device; and

an attachment unit interface (AUI), coupled with the MAC(s), the AUI having four (4) 10Gb/s attachment unit interface (XAUI) channels, each channel supporting 2.5Gb/s communication rates which are aggregated to provide the 10Gb/s physical channel.

44. (Canceled).

45. (Currently Amended) An apparatus according to claim [[44]] 43, wherein the plurality of MAC(s) include 1Gb/s MAC(s), and wherein one or more 1Gb/s MAC(s) are dynamically selected to establish a sub-10Gb/s virtual channel within the 10Gb/s physical channel.

46. (Previously Presented) An apparatus according to claim 45, wherein up to two 1Gb/s MAC(s) are coupled to a XAUI channel, wherein when so coupled each XAUI channel selectively provides 1Gb/s virtual channel resolution within the 10Gb/s physical channel.

47. (Currently Amended) The apparatus of claim 43, ~~the attachment unit interface comprising:~~

~~at least four (4) 10 gigabit attachment unit interface (XAUI) channel(s);~~ wherein
content from up to two (2) 1Gb/s MAC(s) are selectively routed through each of the four
XAUI channels such that each XAUI channel supports 1Gb/s virtual channels.

REMARKS

Applicants thank the Examiner for finding claims 44, 46 and 47 allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Applicants respectfully requests reconsideration of the above referenced patent application in view of the amendments and remarks set forth herein, and respectfully request that the Examiner withdraw all rejections. The Advisory Action dated March 23, 2007 states that the amendments filed March 09, 2007 will not be entered since:

“...The proposed amendment(s) filed after a final rejection, but prior to the date of filing a brief, will not be entered because

(a) They raise a new issue that would require further consideration and/or search (see NOTE below);...”

Insofar as the amendments filed March 09, 2007 have not been entered, Applicants submit herein amendments to the claims which have most recently been entered by the Examiner. In other words, Applicants herein submit amendments to the claims as presented in Applicants’ Communication dated October 20, 2006. Claims 30, 39, 43, 45 and 47 have been amended. No claims have been canceled. No claims have been added. Thus, claims 30-47 are pending.

35 U.S.C. §102 Rejections

35 U.S.C. §102(b) Rejection over *Timm*

The Office Action rejects claims 30-47 under 35 U.S.C. §102(b) as being anticipated by Timm et al., USPN 6,055,268 (*Timm*). For some of the claims listed as rejected under 35 U.S.C. §102(b), no basis for rejection is provided by the Office Action. For the purpose of providing a full response, Applicants respond to a rejection of all claims 30-47 based on *Timm*.

The Office Action alleges that the reference discloses, *inter alia*, automatically aggregating multiple media access controllers (MACs), based, at least in part, on an

identified communication capability of a remote device. A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference, wherein the identical invention is shown in as complete detail as is contained in the claim. *See* M.P.E.P. §2131. For at least the following reasons, Applicants traverse the above rejection.

Rejected claims 30-47 include independent claims 30, 39 and 43. The Office Action dated January 11, 2007 states, in the *Allowable Subject Matter* section on page 7, that claim 44 would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Claim 44, which depended directly from claim 43, is canceled herein. Independent claim 43 is amended herein to recite in a salient portion:

“...an attachment unit interface (AUI), coupled with the MAC(s), the AUI having four (4) 10Gb/s attachment unit interface (XAUI) channels, each channel supporting 2.5Gb/s communication rates which are aggregated to provide the 10Gb/s physical channel.”

Each of currently amended independent claims 30 and 39 now recite similar limitations. Applicants note that, with the exception of a corrected claim dependency and removal of a reference to supporting “up to” 2.5GB/s, independent claim 43 – and similarly claims 30 and 39 – now recites a combination of limitations which has already been found to be allowable in the Office Action. Therefore, Applicants assert that independent claims 30, 39 and 43 are not anticipated by *Timm*.

Applicants respectfully submit that *Timm* fails to disclose an attachment unit interface (AUI), coupled with the MAC(s), the AUI having four (4) 10Gb/s attachment unit interface (XAUI) channels, each channel supporting 2.5Gb/s communication rates which are aggregated to provide the 10Gb/s physical channel, as variously recited in each of independent claims 30, 39 and 43. In depending directly or indirectly from one of these independent claims, each of dependent claims 31-38, 40-42 and 44-47 incorporates at least one limitation not taught by *Timm*. Accordingly, the reference fails to anticipate each of the above rejected claims, and Applicants request that the 35 U.S.C. §102(b) rejection of claims 30-47 be withdrawn.

35 U.S.C. §103(a) Rejections

35 U.S.C. §103(a) Rejection over *Timm*, “802.3ae 5 Criteria” and “XAUI/XGXS Proposal”

The Office Action rejects claims 38, 42 and 45 under 35 U.S.C. §103(a) as being obvious in light of *Timm* and further in view of “802.3ae 5 Criteria” and “XAUI/XGXS Proposal” presentation at IEEE 802.3 10 Gb/s Task Force May 2000 Interim Meeting Plenary Week, July 11-12, 2000. The above rejection relies in part on the previously-discussed 35 U.S.C. §102(b) rejection of parent claims 30, 39 and 43. For at least the following reasons, Applicants traverse the above rejection.

As discussed above, *Timm* fails to disclose at least one limitation in each of independent claims 30, 39 and 43 – e.g. an attachment unit interface (AUI), coupled with the MAC(s), the AUI having four (4) 10Gb/s attachment unit interface (XAUI) channels, each channel supporting 2.5Gb/s communication rates which are aggregated to provide the 10Gb/s physical channel. In rejecting the above claims for obviousness, the Office Action does not allege that any combination of *Timm*, “802.3ae 5 Criteria” and “XAUI/XGXS Proposal” teaches or suggests this distinguishing limitation of parent claims 30, 39 and 43.

Applicants respectfully submit that the references do not teach or suggest this distinguishing limitation. In depending from one of these independent claims, each of the above rejected claims incorporates at least one limitation which is not taught or suggested by the references. For at least the foregoing reasons, the references fail to render the above claims obvious, and Applicants request that the above 35 U.S.C. §103(a) rejection of claims 38, 42 and 45 be withdrawn.

CONCLUSION

For at least the foregoing reasons, Applicants submit that the objections and rejections have been overcome. Therefore, claims 30-47 are in condition for allowance and such action is earnestly solicited. The Examiner is respectfully requested to contact the undersigned by telephone if such contact would further the examination of the present application. Please charge any shortages and credit any overcharges to our Deposit Account No. 02-2666.

Respectfully submitted,
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